METHOD FOR FORMING AN ELECTROSTATICALLY-DOPED CARBON NANOTUBE DEVICE

ABSTRACT OF THE DISCLOSURE

The present invention provides a method and associated structure for forming an electrostatically-doped carbon nanotube device. The method includes providing a carbon nanotube having a first end and a second end. The method also includes disposing a first metal contact directly adjacent to the first end of the carbon nanotube, wherein the first metal contact is electrically coupled to the first end of the carbon nanotube, and disposing a second metal contact directly adjacent to the second end of the carbon nanotube, wherein the second metal contact is electrically coupled to the second end of the carbon nanotube. The method further includes disposing a first metal electrode adjacent to and at a distance from the first end of the carbon nanotube, wherein the first metal electrode is capacitively coupled to the first end of the carbon nanotube, and disposing a second metal electrode adjacent to and at a distance from the second end of the carbon nanotube, wherein the second metal electrode is capacitively coupled to the second end of the carbon nanotube. The method still further includes selectively applying a first bias to the first metal electrode to electrostatically dope the first end of the carbon nanotube and selectively applying a second bias to the second metal electrode to electrostatically dope the second end of the carbon nanotube.